California Microgrid Roadmap Scoping Workshop

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What is a Microgrid?

"A microgrid contains multiple customers, multiple resources, [has] resource interconnection on both sides of the meter, [is] islandable, [and is] capable of providing grid services using existing distribution network, but potentially involving dedicated distribution infrastructure." (Microgrids: A Regulatory Perspective, CPUC Staff Paper, 2014)

"A microgrid is a group of interconnected loads and distributed energy resources within clearly defined electrical boundaries that acts as a single controllable entity with respect to the grid. A microgrid can connect and disconnect from the grid to enable it to operate in both grid-connected or island-mode." (U.S. Department of Energy)

Existing Microgrids

(per DOE definition as reported by IOUs)

PG&E

- **Santa Rita Jail (Dublin, CA)**
  - 6.6 MW (Includes Diesel, PV, Storage, Fuel Cell and Wind)
  - Demonstrate the commercial viability of a Consortium for Electric Reliability Technology Solutions (CERTS) microgrid
- **Blue Lake Rancheria (Blue Lake, CA)**
  - 2 MW (Includes Diesel, PV and Storage)
  - Demonstrate implementation of Siemens new microgrid management software to manage distributed energy resources

SCE

- **Fort Irwin (Fort Irwin, CA)**
  - 8.6 MW (Includes Gas Turbine Generator, PV and Waste to energy)
  - Provide reliable source of energy during prolonged power outages

SDG&E

- **Borrego Springs (Borrego Springs, CA)**
  - 37 MW (Includes Generators, Batteries, PV, and Ultracap)
  - Operation of a community scale microgrid

Microgrids: A Regulatory Perspective (CPUC Staff Paper, 2014)

"State utility commissions must play a role in enabling the development of microgrids as part of the larger process of grid modernization…However, microgrid architectures and technical standards must adhere to requirements of reliability, environmental protection, safety, security and resilience…"

Issues addressed:

- Definition of a microgrid reference architecture
- Characterization of suitability of locations for microgrid development
- Establishment of market mechanisms to enable third party provision of microgrid services
- Determination of utility relationship to (and ownership of) microgrid
- Cost allocation

www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=5118

Distributed Resources Plan (R.14-08-013)

- The goal of the Distribution Resource Plans (DRP) proceeding is to move the state towards a high-penetration distributed energy resource (DER) future that accomplishes the State's climate and energy goals while producing ratepayer benefits.

- Within the DRP, the Microgrid Project goal is to develop a demonstration project where the Utility would serve as a distribution system operator of a microgrid where DERs serve a significant portion of customer load and reliability services.

DRP: Microgrid Demonstration Projects

- **SDG&E: Borrego Springs Microgrid**
  - Approved February 2017 (D.17-02-007)
  - Area is fed by a single transmission line
  - Microgrid is already operational
    - High concentration of solar generation
    - Some energy storage is installed
  - Final project results by Q3 2018

- **SCE: North Area of Mono County**
  - Pending CPUC Decision
  - Area is served by single transmission line
  - Includes hydro generation from SCE-owned Poole Generation Plant (11 MW)
  - No existing microgrid. Proposed microgrid would include BTM Smart Inverters and Storage
  - Purpose: to demonstrate the operations and coordination of multiple DERs managed by a dedicated control system

Formal proceeding documents are found using the Rulemaking numbers:

- R.14-08-013: Distribution Resources Plans Proceeding
- R.15-03-011: Energy Storage Proceeding
- R.11-09-011: Interconnection Proceeding

Other Distribution Resources Plan documents, including workshop presentations, and other background papers are on the CPUC web site:

http://www.cpuc.ca.gov/General.aspx?id=5071